

- (1) Have a design burst pressure of at least 25 psig;
- (2) Have a maximum allowable working pressure of at least 5 psig;
- (3) Be capable of withstanding at least 2.0 psi vacuum without collapsing or constricting;
- (4) Be electrically continuous with a maximum resistance of ten thousand (10,000) ohms;
- (5) Have flanges with:
 - (i) A bolt hole arrangement complying with the requirements for 150 pound class ANSI B16.5 flanges, and
 - (ii) One or more 0.625 inch diameter holes in the flange located midway between bolt holes and in line with the bolt hole pattern;
- (6) Be abrasion resistant and resistant to kinking; and
- (7) Have the last 1.0 meter (3.3 feet) of each end of the vapor hose marked in accordance with paragraph (d) of this section.
- (g) Vapor hose handling equipment must be provided with hose saddles which provide adequate support to prevent kinking or collapse of hoses.

[CGD 88-102, 55 FR 25446, June 21, 1990, as amended by CGD 95-072, 60 FR 50462, Sept. 29, 1995; CGD 96-041, 61 FR 50727, Sept. 27, 1996]

§39.20-3 Cargo gauging system—TB/ALL.

- (a) Each cargo tank of a tank vessel that is connected to a vapor collection system must be equipped with a cargo gauging device which:
 - (1) Provides a closed gauging arrangement as defined in §151.15.10 of this chapter that does not require opening the tank to the atmosphere during cargo transfer;
 - (2) Allows the operator to determine the liquid level in the tank for the full range of liquid levels in the tank;
 - (3) Indicates the liquid level in the tank at the location where cargo transfer is controlled; and
 - (4) If portable, is installed on the tank during the entire transfer operation.
- (b) Except when a tank barge complies with §39.20-9(a) of this part, each cargo tank of a barge must have a high level indicating device that:
 - (1) Provides a visual indication of the liquid level in the cargo tank when the

cargo level is within 1.0 meter (3.28 feet) of the tank top;

- (2) Has the maximum liquid level permitted under §39.30-1(e) of this part at even keel conditions conspicuously and permanently marked on the indicating device; and
- (3) Is visible from all cargo control areas on the tank barge.

§39.20-7 Tankship liquid overfill protection—T/ALL.

- (a) Each cargo tank of a tankship must be equipped with an intrinsically safe high level alarm and a tank overfill alarm.
- (b) The high level alarm and tank overfill alarm required by paragraph (a) of this section, if installed after July 23, 1990 must:
 - (1) Be independent of each other;
 - (2) Alarm in the event of loss of power to the alarm system or failure of electrical circuitry to the tank level sensor; and
 - (3) Be able to be checked at the tank for proper operation prior to each transfer or contain an electronic self-testing feature which monitors the condition of the alarm circuitry and sensor.
- (c) The high level alarm required by paragraph (a) of this section must:
 - (1) Alarm before the tank overfill alarm, but no lower than 95 percent of tank capacity;
 - (2) Be identified with the legend "High Level Alarm" in black letters at least 50 millimeters (2 inches) high on a white background; and
 - (3) Have audible and visible alarm indications that can be seen and heard on the vessel where cargo transfer is controlled.
- (d) The tank overfill alarm required by paragraph (a) of this section must:
 - (1) Be independent of the cargo gauging system;
 - (2) Have audible and visible alarm indications that can be seen and heard on the vessel where cargo transfer is controlled and in the cargo deck area;
 - (3) Be identified with the legend "TANK OVERFILL ALARM" in black letters at least 50 millimeters (2 inches) high on a white background; and
 - (4) Alarm early enough to allow the person in charge of transfer operations

to stop the transfer operation before the cargo tank overflows.

(e) If a spill valve is installed on a cargo tank fitted with a vapor collection system, it must meet the requirements of § 39.20-9(c) of this part.

(f) If a rupture disk is installed on a cargo tank fitted with a vapor collection system, it must meet the requirements of § 39.20-9(d) of this part.

§ 39.20-9 Tank barge liquid overflow protection—B/ALL.

Each cargo tank of a tank barge must have one of the following liquid overflow protection arrangements.

(a) A system meeting the requirements of § 39.20-7 of this part which:

(1) Includes a self-contained power supply;

(2) Is powered by generators installed on the barge; or

(3) Receives power from a facility and is fitted with a shore tie cable and a 120 volt 20 amp explosion-proof plug which meets:

(i) ANSI/NEMA WD6;

(ii) NFPA 70, Articles 410-57 and 501-12; and

(iii) § 111.105-9 of this chapter.

(b) An intrinsically safe overflow control system which:

(1) Is independent of the cargo gauging device required by § 39.20-3(a) of this part;

(2) Actuates an alarm and automatic shutdown system at the facility overflow control panel, or on the vessel to be lightered if a lightering operation, 60 seconds before the tank becomes 100 percent liquid full;

(3) Is able to be checked at the tank for proper operation prior to each loading;

(4) Consists of components which, individually or in series, will not generate or store a total of more than 1.2 V, 0.1 A, 25 mW, or 20 microjoules;

(5) Has at least one tank overflow sensor switch with normally closed contacts per cargo tank;

(6) Has all tank overflow sensor switches connected in series;

(7) Has interconnecting cabling that meets § 111.105-15(b) of this chapter; and

(8) Has a male plug with a 5 wire, 16 amp connector body meeting IEC 309-1/309-2 which is:

(i) Configured with pins S2 and R1 for the tank overflow sensor circuit, pin G connected to the cabling shield, and pins N and T3 reserved for an optional high level alarm circuit meeting the requirements of this paragraph; and

(ii) Labeled "Connector for Barge Overflow Control System" and with the total inductance and capacitance of the connected switches and cabling.

(c) A spill valve which:

(1) Meets ASTM F1271;

(2) Relieves at a pressure higher than the pressure at which the pressure relief valves meeting the requirements of § 39.20-11 operate;

(3) Limits the maximum pressure at the cargo tank top during liquid overflow, at the maximum loading rate for the tank, to not more than the maximum design working pressure for the tank; and

(4) If the vessel is in ocean or coastwise service, has provisions to prevent opening due to cargo sloshing.

(d) A rupture disk arrangement which meets paragraphs (c)(2), (c)(3) and (c)(4) of this section and is approved by the Commandant (G-MSO).

[CGD 88-102, 55 FR 25446, June 21, 1990, as amended by CGD 95-072, 60 FR 50462, Sept. 29, 1995; CGD 96-041, 61 FR 50727, Sept. 27, 1996]

§ 39.20-11 Vapor overpressure and vacuum protection—TB/ALL.

(a) The cargo tank venting system required by § 32.55 of this chapter must:

(1) Be capable of discharging cargo vapor at 1.25 times the maximum transfer rate such that the pressure in the vapor space of each tank connected to the vapor collection system does not exceed:

(i) The maximum design working pressure for the tank, or

(ii) If a spill valve or rupture disk is fitted, the pressure at which the device operates;

(2) Not relieve at a pressure corresponding to a pressure in the cargo tank vapor space of less than 1.0 psig;

(3) Prevent a vacuum in the cargo tank vapor space, whether generated by withdrawal of cargo or vapor at maximum rates, that exceeds the maximum design vacuum for any tank connected to the vapor collection system; and